

**SYNTHESIS AND CHARACTERIZATION OF PALM OIL BASED
POLYOL WATERBORNE POLYURETHANE**

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TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENT	iii
TABLE OF CONTENTS	iv
LIST OF TABLES	vi
LIST OF FIGURES	vii
LIST OF ABBREVIATIONS	ix
ABSTRACT	xi
ABSTRAK	xii
CHAPTER 1 INTRODUCTION	
1.1 Background	1
1.2 Problem statement	4
1.3 Significance of study	5
1.4 Objectives of study	6
CHAPTER 2 LITERITURE REVIEW	
2.1 Waterborne polyurethane (WPU)	7
2.2 Petroleum- based waterborne polyurethane	12
2.3 Plant-based waterborne polyurethane	13
2.3.1 Palm oil-based waterborne polyurethane	15
2.3.2 Soy bean oil-based waterborne polyurethane	17
2.3.3 Jatropha oil-based waterborne polyurethane	19
2.3.4 Rapeseed oil-based waterborne polyurethane	21
2.3.5 Castor oil-based waterborne polyurethane	23
CHAPTER 3 METHODOLOGY	
3.1 Materials	25
3.1.1 Raw material	25
3.1.2 Chemicals	25
3.1.3 Apparatus	26
3.2 Methods	26
3.2.1 Preparation of palm oil-based polyol	28
3.2.2 Preparation of palm oil-based waterborne polyurethane	29
3.3 Characterization	29
3.3.1 FTIR spectroscopy analysis	30

CHAPTER 4 RESULTS AND DISCUSSION		
4.1	Fourier Transform Infrared (FTIR) analysis	31
4.1.1	Fourier Transform Infrared (FTIR) analysis of palm oil	31
4.1.2	Fourier Transform Infrared (FTIR) analysis of epoxidized palm oil	33
4.1.3	Fourier Transform Infrared (FTIR) analysis of palm oil based polyol	37
4.1.4	Fourier Transform Infrared (FTIR) analysis of waterborne polyurethane palm oil based polyol	41
4.2	SEM analysis of waterborne polyurethane	43
4.3	Thermal Gravimetric Analysis (TGA) of waterborne polyurethane	44
CHAPTER 5 CONCLUSION AND RECOMMENDATIONS		
5.1	Conclusion	46
5.2	Recommendations	47
CITED REFERENCES		49
APPENDICES		53
<i>CURRICULUM VITAE</i>		61

ABSTRACT

SYNTHESIS AND CHARACTERIZATION PALM OIL BASED POLYOL WATERBORNE POLYURETHANE

Palm oil based polyol was successfully synthesized in this study by the epoxidation and hydroxylation process. The waterborne polyurethane was formed from the reaction of polyol, isocyanate and dimethylol propionic acid with the ratio 1:0.3:0.04. The arising problem from non-environmental friendly and non-biodegradability of petroleum based waterborne polyurethane can be overcome by replacing it with the vegetable oil based waterborne polyurethane such as palm oil based polyol waterborne polyurethane. Palm oil based polyol and palm oil based polyol waterborne polyurethane were analyzed by Fourier Transform Infrared Spectroscopy (FTIR) and Scanning Electron Microscope (SEM). FTIR analysis showed the functional group of C=C in palm oil at 3006 cm^{-1} was broken to form O-H functional group (3454 cm^{-1}) that known as palm oil based polyol and for the final stages, O-H functional group in polyol was shifted by N-H functional group (3334 cm^{-1}) to indicate that waterborne polyurethane was successfully synthesized. Meanwhile, SEM analysis represented that palm oil based polyol waterborne polyurethane film has fibrous structure with flat and smooth surface that suitable for coating application.